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# AGRICULTURE AND GOVERNMENTS IN AN INTERDEPENDENT WORLD

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*The Role of Agriculture in the Structural Adjustment Process of Brazil*

OVERVIEW ON THE ADJUSTMENT PROCESS

Brazil does not behave any differently from many other Latin American countries that relied so much on external savings to finance their import substitution industrialization. The extremely high oil prices and interest rates after 1979 jeopardized the already unstable growth path of the 1970s. Up to 1974 average growth rate of GDP per year was above 9 per cent since 1967. In 1975 an ambitious import substitution programme for capital and intermediary goods was defined. From 1975 to '78 output growth averaged 6.1 per cent. Until 1979 there was indecision in the macroeconomic adjustment policy; 1979 and 1980 can be best described as a desperate use of foreign short term loans with an average growth of 8.2 per cent. From 1981 to 1983 there was a recessionary adjustment phase (1.6 per cent average growth); from 1984 to 1986 an aborted recovery phase (8.2 per cent average growth) and in 1987 another year of indecision in macropolicy (2.9 per cent growth).

Chronic trade deficits began to be handled in 1981 and from 1983 on with an expenditure switching type of policy. An effective devaluation of 30 per cent was introduced, indirect taxes of selected consumer goods were increased substantially, as well as income tax on the financial sector. Trade surplus in 1984 and 1985, above 5 per cent of GDP, payed full service on foreign debt, at the expense of the rate of investment that fell from an average of 23 per cent in the 1970s to barely 18 per cent in the 1980s. In 1986 a heterodox stabilization policy was tried, with price freeze and monetary reform, but a generous wage policy and a large government operational deficit (3.5 per cent of GDP) reignited inflationary expectations just after a six month period of remonetization. The inflation rate went up to a record level of 600 per cent a year, followed by another price freeze and a more orthodox gradual stabilization policy in 1987. In early 1988 inflation was back to the 400 per cent a year level and expected GDP growth rate is zero.

A deeper look into the nature of this adjustment process requires a note on the role played by government as the largest financial intermediary/investor in productive activity (Werneck 1986). Table 1 indicates the rapid deterioration in the role played by central government in domestic saving. The next tax burden was reduced by 30 per cent from 1970 to 1980 and collapsed afterwards due to a smaller gross tax burden but mostly to a substantial increment in transference to the private sector in the form of interest paid on public debt and subsidies.

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## AGRICULTURE GROWTH AND FINANCING

Agricultural growth process in the 1970s can still be characterized as an extensive system (Dias, 1978). Migration from traditional rural areas to the centre-west, mechanization and incorporation of new land into cultivation compounded for more than two thirds of growth in output. The main difference from the previous decade was that a growing share of this new land was coming from a savannah type of soil (acid soil, weak in phosphorus), 'cerrado', and not from tropical forest with high fertility. Instead of getting the initial capital out of forest timber, what was required were resources to be invested in machinery, lime and fertilizer. It was not an abrupt change but a gradual one with a reintroduction of the traditional system limited to the Amazon frontier which did not succeed as well as the 'cerrado'.

The fundamental constraint to the rate of growth in the extensive system is access to land and labour availability; in the cerrado area we have to add credit. This was done in a peculiar way. The capital market in Brazil is extremely segmented. Construction industry is financed by a saving account system that warrants full indexation against inflation plus a 6 per cent real rate of return and can lend on a term up to 15 years. Basic industries get their long term credit from the National Economic and Social Development Bank (BNDES) which is funded by the fiscal budget and a special fiscal fund (sale tax on industrial products). Working capital for commerce and industry is found in commercial banks and financial institutions that raise money on short term. Agriculture has been financed by a compulsory requirement on sight deposits at regular commercial banks and mostly by the Banco do Brasil (government controlled) that up to 1986 had the power to issue money through an open account with the Central Bank.

In the early 1970s rural credit charged an interest rate near zero or a small negative value, but as inflation began to increase after 1973 it became strongly negative. The most acceptable interpretation for this large subsidy is that it is a compensation for the rural sector having the discrimination implicit in an overvalued exchange rate in existence since the 1950s when import substitution industrialization started (Oliveira, 1984). The reason why it became so strong in the 1970s is very much related to the nature of the Second National Development Plan (II PND). As a reaction to a growing trade deficit and the first oil shock the Brazilian government engaged in an ambitious programme of import substitution in capital and intermediary goods. From the point of view of agriculture this meant higher prices for machinery of all kinds and fertilizers. The subsidized credit programme had a dual objective: (1) a compensating income transfer to a sub-sector of rural producers; and (2) sustaining demand for these recently installed industries.

The strong competition for funds within the government budget and the financing of foreign private debt in the late 1970s were much more than the inflationary tax could bear; those were disruptive years in the sense that the government operational deficit increased rapidly and inflation started to accelerate. Indexation became widespread in the economy and the money base shrank carrying along the agriculture credit system. Table 2 indicates how it was rationed, specially from 1978 and 1984. Investment credit was cut first (halting temporarily growth in the cerrado area), then commercial credit (partially

TABLE 1 *Tax burden, government consumption and savings (percent of GDP)*

Years	Gross Burden	Subsidies	Soc. Sec.	Inter. P. Debt	Net Tax Burden	Pub. Adm. Consump.	Public Savings
1970	27.07	0.77	8.21	1.30	16.79	11.32	5.46
1975	25.57	2.81	7.02	1.24	14.50	10.64	3.87
1980	23.24	3.64	7.61	1.89	10.10	9.01	1.09
1985	21.30	1.56	7.12	10.93	1.69	9.70	-8.02

Source: FGV-National Accounts.

TABLE 2 *Inflation, money base and rural credit*

Year	Inflation rate	Money		Working	Rural Credit		
		Base /GDP	Supply /GDP		Investment	Commercial	Total
1970	19	0.063	0.183	10,303	6,219	6,489	23,011
1972	16	0.055	0.177	13,760	10,922	8,343	33,026
1974	35	0.052	0.169	26,090	17,540	14,316	57,947
1976	46	0.049	0.145	36,524	28,056	21,966	86,546
1978	41	0.053	0.128	36,271	18,994	20,791	76,056
1980	110	0.046	0.108	52,980	17,564	23,088	93,632
1982	100	0.040	0.087	50,586	10,314	17,741	78,640
1984	224	0.033	0.064	25,558	4,462	6,238	36,259
1986	65	0.049	0.123	50,776	18,521	15,544	84,842

Source: Central Bank.

TABLE 3 *Employment and income per caput*

	Economic Active Population			GDP per active member		
	1970	1980	1985	1970	1980	1985
(C\$1000 of 1980)						
Agriculture	13088	13109	15190	44.0	94.0	91.6
Industry	5296	10675	11783	337.8	440.3	414.4
Services	11174	20012	26261	234.7	319.8	301.1
Total	29558	43796	53234	168.7	281.6	266.4

Note: Industry includes Construction business.

Source: FIBGE and National Accounts-FGV.

compensated for by gradual indexation of minimum prices) and, finally, working capital.

The second oil shock and the DC's adjustment policies in the early 1980s promoted a large terms of trade loss to the agricultural sector. Its impact was magnified by the fact that higher transport costs associated with much lower limits to rural credit halted the extensive growth process leading to a severe restriction on livestock growth (Melo, 1981). Another element of the macroeconomic adjustment policy, higher domestic real interest rates indexed to inflation, increased the opportunity cost of holding cattle stocks (Rezende, 1987).

The structural change that followed shifted a thirty years trend, increasing employment in the agricultural sector although at an extremely low relative wage. Table 3 shows the strength of this change.

The absorption of 22 per cent of the new active population in the early 1980s was possible because of much lower wages in the urban sector, mostly for skilled labour, as in construction industry, data in Table 4 leaves no doubt about who played the burden of the recessive adjustment. More qualified labour, as in the manufacturing sector of the State of São Paulo also had to give up a large share of their wage, but not 50 per cent as for less skilled workers.

## STABILIZATION POLICY AND OUTPUT PERFORMANCE

The stabilization policy undertaken after 1981 meant for the agricultural sector higher interest rates (rationing had already started in 1977) and lower wage rates (qualified by the fact that migration, both rural-urban and rural-rural, was halted) leading toward a rationalization of production methods. Recession in the urban sector and higher transport costs should lead to a loss in terms of trade and a cutback in output. Devaluation of the exchange rate (small and shortlived in 1979, large and longlasting in 1983) should lead to a switch in the output mix toward traded goods.

Agricultural output, mostly annual crops, has shown in recent years a remarkable change in performance in response to the adjustment process. We indicated above that the extensive growth was curtailed by: (1) the energy crises; (2) the financial nature of the public deficit crisis; and (3) the fast absorption by the urban sector of migrant labour from traditional agricultural areas in the 1970s. Entrepreneurs in the agriculture sector should foresee a new opportunity of investment in the development of traditional areas (already with transport and commercial infrastructure) as long as technology is available. Land as the dominant factor of product in the extensive system should lose its strategic role and value. Data in Table 5 refer to output in selected years with above normal weather conditions; the purpose of this choice is to avoid noise produced by adverse factors that do not reflect potential production capability. Although we have stated output in gross weight, interpretation is not affected significantly by changes in crop mix that have occurred during the period under analysis.

Grains and oil-seed series indicate a substantial change in the nature of output growth after 1981/82. Land productivity becomes almost the sole source to explain growth, in radical contrast with the previous period when new land under crops was responsible for more than 80 per cent of total change in output. Almost

TABLE 4 *Real wages indicators*

Year	Industry: average wage	Agriculture: daily wage earner	Construction: unqualified wage earner
1975	100	100	100
1976	105	99	97
1977	111	102	100
1978	119	104	101
1979	110	96	85
1980	107	105	84
1981	122	109	91
1982	130	99	94
1983	101	72	59
1984	94	68	43
1985	96	53	58
1986	112	92	81

Sources: Industry-Fiesp; Agriculture-Fgv; Construction-Fibge Deflator IGP-Fgv

TABLE 5 *Output and Acreage*

Product	1976/77	Harvested Area/Production (1000 Ha) / (1000 T)		1986/87
		1981/82	1984/85	
<i>Grains</i>				
Rice	5992/8944	6025/9734	4755/9025	6015/10460
Oats	40/37	95/61	150/166	144/168
Rye	9/8	5/4	13/13	3/4
Barley	94/95	167/99	110/171	103/191
Beans	4551/2290	5926/2903	5316/2549	5217/2025
Maize	11797/19256	12620/21842	11798/22018	13511/26824
Sorghum	178/435	123/226	170/268	245/461
Wheat	3153/2066	2828/1827	2677/4320	3422/5709
	25814/33131	27789/36696	24989/38530	28660/45842
<i>Oil Seeds</i>				
Peanuts	229/321	237/317	193/339	143/196
Castor Oil	254/224	462/192	497/418	263/107
Soybean	7070/12513	8203/12836	10153/18279	9153/16876
Cotton	4097/1245	3624/1263	3590/1871	1972/1076
	11650/14303	12526/14608	14433/20907	11531/18255
<i>Annual Crops</i>	37464/47434	40315/51304	39422/59437	40191/64097
<i>Sugar Cane*</i>	2270/120.1	3084/186.6	3912/247.2	4323/273.9
<i>Animal Products</i>				
Beef	/2445	/2397	/2222	/2060
Pork	/510	/626	/577	/708
Poultry	/497	/1192	/1145	/1260
Milk	/9566	/11461	/12202	/13268

Note: \*Production in 1000000 T.

Source: FIBGE

the same pattern can be identified in rice, maize, wheat, soybean and cotton, indicating that it is a generalized process and not specifically linked to a technological breakthrough in one individual crop. Sugar cane area (due to the subsidized Alcohol Programme) kept growing in the 1980s, in contrast with other important products and most probably substituting for pasture land. Poultry, pork and milk perform much better than other livestock systems.

It is a consistent representation of a system that is responding to the adjustment process with rationalization of production methods, increasing productivity and eventually competitiveness in the international market. This pattern is also consistent with the hypothesis that potential growth is being constrained by a lack of investment which is not peculiar to the rural sector but a general constraint to the whole economy. Since 1984 investment expenditures in machinery and land fertilization are increasing and are probably financed by farmers with a larger share of their own resources, although investment credit increased in 1986 with remonetization of the economy but was again substantially reduced in 1987.

Surprisingly, there is no indication that a larger share of output is being absorbed by the international market. Table 6 shows that from the late 1970s there was no trend in the traded share of agricultural output, although there was considerable instability due to output and domestic demand fluctuations.

## DOMESTIC TERMS OF TRADE EVOLUTION

Since 1967, Brazilian industrialization policy was export orientated although most attention given referred to sectors with unused capacity. By 1973 many industrial sectors were producing at full capacity and the economy was running a trade deficit due to a large increase in imports of capital and intermediary goods. For many export orientated activities a selective fiscal incentive system did what an exchange rate devaluation would have done, except that the latter would affect all economic activities across the board, including primary agricultural products. In order to limit the effect to the industrial sector, fiscal incentives were chosen, reducing the net tax burden and simultaneously increasing the net effective protection rate. Sectors linked to agriculture that were granted the highest incentives were: natural fibre textiles, edible oils, wood industries including cellulose plants, orange juice, tobacco and meat industries.

It is not a surprise that a country deeply involved in import substitution should react like the Brazilian government in 1974, after the first oil shock, with another promotion of import substitution. To the agricultural sector this meant higher prices for machinery and fertilizers, partially subsidized by rural credit. As a complement to the import substitution policies and as a response to the energy crises, large investments started in oil prospecting and oil substitution (the most well known is subsidized sugar cane/alcohol). For agriculture this meant higher prices for sugar cane and a concentration of investment credit in the alcohol programme since 1975; from 1980 until 1985 this was the only rural credit programme with a real increment in resources (Melo, 1983, 1985).

Some compensation began with the maxidevaluation of the exchange rate in 1983. It is important to remark that devaluation in December 1979 came along with an increase in export taxes of some selected products including soybeans.



TABLE 6 *Traded share of agriculture output (%)*

1970	0.133	1978	0.185
1971	0.137	1979	0.168
1972	0.157	1980	0.198
1973	0.186	1981	0.230
1974	0.165	1982	0.193
1975	0.208	1983	0.208
1976	0.225	1984	0.220
1977	0.207	1985	0.199

Source: Manoel, A., and Barros, J.R.M., 'Agricultura Brasileira: Transformações e Perspectivas na Década de 80' ANPEC, 1987, Salvador.

TABLE 7 *Domestic terms of trade*

Year	Non Traded	Traded	Traded (w/coffee)
1977	100.0	100.0	100.0
1978	104.1	84.9	94.5
1979	105.5	82.0	94.8
1980	104.7	61.0	69.3
1981	91.2	53.3	64.9
1982	73.9	53.6	64.3
1983	97.0	65.3	83.4
1984	81.1	69.5	88.5
1985	79.7	65.3	69.5
1986	96.5	103.1	74.8
1987	64.8	58.7	69.4

Source: Melo, 1985; 85–87 *Ipardes*.

TABLE 8 *Effective protection on domestic market*

Sector	Effective Protection	Subsidy Effect	Taxation Effect	Net Effective Protection
<i>Agriculture</i>	-8.2	-7.7	-0.4	-22.8
Forestry	-38.9	-39.3	-0.5	-48.5
Farming	-1.1	0.4	1.5	-16.8
Animals	-8.0	-10.1	-2.1	-22.6
<i>Industry</i>	45.0	41.3	-3.7	24.7
Capital Goods	63.3	67.5	4.2	51.0
Interm. Goods	46.0	40.5	-5.5	22.9
Consum. Goods	34.2	28.5	-5.7	13.0

Source: Tyler, W. and Suzigan, W. – 'Políticas Comerciais e Incentivos Industriais no Brasil 79–81' INPES, Jul. 81, Rio de Janeiro.

A strong reaction by southern farmers cancelled that tax one month later but it did not bring much benefit because exchange rate mini-devaluations were pegged to a prefixed inflation target of 50 per cent a year when it effectively went on a 110 per cent basis. In February of 1983 mini-devaluations were pegged daily on the current estimated inflation rate, which was revised every month as soon as data was available.

Devaluation should improve more those sectors in the economy that have a larger share of traded goods as agriculture does, if fiscal policy is not expansionary as it was in 1984/85 and most of 1986 (Lopes, 1987). It will also not change the fundamental character of discrimination in commercial policy against the primary agricultural sector orientated predominantly to the export market. The last generalized treatment of effective protection collected price data between 1980 and 1981 (Tyler, 1981). Because of widespread use of non-tariff protection, implicit tariffs were calculated between observed domestic prices and border prices. Total protection is decomposed in a 'subsidy effect', protection implicit in the final product and a 'taxation effect' given the protection on intermediary products. Overvaluation of the exchange rate was calculated at 18.8 per cent; net effective protection estimate should give a rough estimate of the future impact of devaluation.

Agriculture was discriminated against in the middle of the adjustment process. It is the only sector with a negative subsidy effect. More advanced agricultural technology, as in crop production, was paying input prices slightly below international market prices; subsidy in rural credit was taken into consideration but, as pointed out above, diminished substantially after 1981. Minimum-support prices for important food products (also non traded) like rice, beans and maize, were increased after a severe shortage in 1979/80 and commodity prices experienced an unusual low level in the 1980s, except for a short-lived improvement in 1983/84, contributing to explain why output adjustment was not orientated toward traded products (Rezende, 1987).

## CONCLUSION

The rural sector is playing an important role in the adjustment process. Discriminated against on the external front, agriculture's response to the crises has been an exceptional gain in productivity, an increment in output of non traded (food) products with a large loss in terms of trade. An increase in the absolute level of rural employment was fundamental to allow the urban sector its own adjustment concentrated on the external front. This is a new version of the traditional role of agriculture in the Latin American growth pattern, to subsidize urban adjustment.

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## DISCUSSION OPENING – ADOLFO FIGUEROA

This paper deals with a very important topic: the links between the macroeconomic policies and the performance of agriculture. In spite of the fact that a lot of work is being directed to this issue, the global-sectoral relationships in the Latin American economies are not well understood yet .

Professor Dias' paper is an important contribution to the understanding of that problem. There is a good description of the changes in the most relevant variables and some very interesting hypotheses. Basically, what he argues is that the role played by agriculture in the process of macroeconomic adjustment in Brazil has been more significant on the internal rather than the external front. Agriculture has shown an expansion in output, particularly food production, and also in higher levels of employment. Hence, agriculture has absorbed a significant part of the so called 'social cost' of the adjustment. However, export in agriculture has not been the basic result of the macroeconomic policies of adjustment in Brazil. This statistical finding clearly contradicts the current conventional view that stabilization policies have positive net effects on agriculture.

The paper has several shortcomings, however. The most important limitation is that the paper is mainly descriptive. An explanation of the reasons behind the statistical figures and hypotheses put forward is lacking. Here I would like to mention the most important questions that require further analysis:

- (a) Why is it that monetary and credit policies had the effect of halting agriculture growth in the 'cerrado' area, but not in the 'traditional' area? Why is it that credit availability decreased while at the same time land-productivity increased? Are they negatively related? In the light of these results, all the discussions and the literature on the need for credit to expand technological innovation in agricultural would seem out of place.
- (b) Why is it that real exchange devaluations do not increase agriculture exports? What are the conditions under which such an effect is expected to be positive?
- (c) Real wages in Brazil are falling (Table 4 in the paper) and yet agriculture for domestic consumption increases. Does it mean that agriculture can expand under conditions of declining effective demand? Clearly, wages are the most important component of demand for food. How to explain this paradox?

I have three final comments on the methodology of this type of study:

- (a) There is a problem with the periods of analysis. Usually agriculture and manufacturing are treated on equal grounds in the short-run analysis, and Professor Dias' paper is no exception. However, it is clear that agriculture and manufacturing are different processes. For one thing, in agriculture the duration of the production process is usually longer. Therefore the reactions to economic incentives will require more time to show the cause-effect relationship. For some products five or six years may not be enough to observe a change in the process, whereas for other products it may be sufficient. In this type of analysis a distinction between the periods of response by commodities should be distinguished. Moreover, given the common divergence between *ex ante* decisions and *ex post* results in agriculture, causality relations cannot be based on statistical data which show *ex post* results.
- (b) The author goes from macro policies, and macro variables, to the sectoral variables of agriculture. This approach assumes that macro variables are exogenous to agriculture. But, are they? Is the effect of agriculture on macro variables negligible? If the answer is in the negative, the more appropriate framework of analysis is the general equilibrium type. The one-way relationship is, however, the more commonly used, as is the case in Professor Dias' paper.
- (c) Macroeconomy and agriculture links need to determine the components that create a particular macro context. One may consider four basic components: three macro prices (exchange rate, interest rate, and wage rate) and price instability (inflation rate). Favourable conditions for agriculture must, therefore, imply different mixes in those components. However, in most discussions that mix is reduced to one element only – the exchange rate. Moreover, short-run and long-run links, both in theory and policy design, are usually neglected, as they are here.

In sum, Professor Dias has produced a very stimulating paper. However, more analytical work is needed to understand the logic of the relationships proposed. In this manner the lessons to be drawn from this case study for the other countries in the region will be even more significant.